PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference TS 6450 PCT	**FOR FURTHER ACTION**	See Form PCT/IPEA/416
International application No. PCT/EP2004/051404	International filing date *(day/month/year)* 08.07.2004	Priority date *(day/month/year)* 09.07.2003
International Patent Classification (IPC) or national classification and IPC E21B7/18		
Applicant SHELL INTERN. RESEARCH MAATSCHAPPIJ B.V. et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
   a. ☒ *sent to the applicant and to the International Bureau)* a total of 1 sheets, as follows:
      ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
      ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
   b. ☐ *(sent to the International Bureau only)* a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒	Box No. I	Basis of the opinion
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☒	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

Date of submission of the demand	Date of completion of this report
03.05.2005	03.08.2005
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Bellingacci, F Telephone No. +49 89 2399-2784

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/051404

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
   - ☐ international search (under Rules 12.3 and 23.1(b))
   - ☐ publication of the international application (under Rule 12.4)
   - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages	
1-18	as originally filed
Claims, Numbers	
4-9	as originally filed
1-3	received on 18.05.2005 with letter of 18.05.2005
Drawings, Sheets	
1/5-5/5	as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
   - ☐ the description, pages
   - ☐ the claims, Nos.
   - ☐ the drawings, sheets/figs
   - ☐ the sequence listing *(specify)*:
   - ☐ any table(s) related to sequence listing *(specify)*:

* *If item 4 applies, some or all of these sheets may be marked "superseded."*

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/051404

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-9
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-9
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Reference is made to the following documents:

D1 = US 6 510 907 A
D2 = US 3 831 753 A
D3 = DE 20 52 516 A

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

V-1 D1, which is considered as the closest prior art, discloses a tool for excavating an object (fig. 4), the tool comprising a jetting system (5) having nozzle means arranged to receive a fluid and abrasive particles via an abrasive particle inlet (14), and arranged to impinge the object to be excavated with a jetted stream (30) of the fluid mixed with the abrasive particles, the tool further comprising a recirculation system arranged to recirculate at least some of the abrasive particles from a return stream (8), downstream impingement of the jetted stream with the object to be excavated, back to the jetting system via the abrasive particle inlet (14), the abrasive particle inlet having an entrance window

The device according to claim 1 differs from said known device in that filtering means are provided in a path fluidly connecting said return stream with the entrance window, for keeping the abrasive particle inlet free from objects of the same size or larger than the size of the entrance window, which filtering means is passable for the abrasive particles.

The subject-matter of claim 1 is therefore new and the claim meets the corresponding requirements of Art. 33(2) PCT.

V-2 The problem solved by the distinguishing feature of claim 1 is to prevent oversized particles from entering the abrasive particle inlet channel.
However, everyday's experience teaches to use filters for preventing larger particles from clogging conduits, and the specific use in the case of abrasive particles is also known, see for example D2, col. 1, lines 7-10 and 41-44. The skilled man will consider therefore as an obvious solution to provide a device as in D1 with a filter as

in the distinguishing part of claim 1, and the subject-matter of claim 1 does not involve therefore an inventive step.

V-3 The filter means disclosed in D2 is provided with the features additionally disclosed in claims 2 to 4, and therefore also said claims do not meet the inventive sep requirement of Art. 33(3) PCT.

V-4 features of claims 2 to 4 are also known from D2, and therefore also said claims do not meet the inventive step requirement of Art. 33(3) PCT.

V-5 The term "skirt" as used in claims 5 and 6 does not unambiguously imply any specific technical meaning, and therefore claims 5 and 6 are considered that the filter means comprises a slit. As the feature is known from D2 the subject-matter of claims 5 and 6 does not involve an inventive step.

V-6 The features of claims 7-9 appears not to involve an inventive step in the light of D1 to D3.

Re Item VII

Certain defects in the international application

- a) The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- b) Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in D2 and D3 is not mentioned in the description, nor are said documents identified therein.

C L A I M S

(105)

1. Tool for excavating an object, the tool comprising a jetting system having nozzle means arranged to receive a fluid and abrasive particles via an abrasive particle inlet, and arranged to impinge the object to be excavated with a jetted stream of the fluid mixed with the abrasive particles, the tool further comprising a recirculation system arranged to recirculate at least some of the abrasive particles from a return stream, downstream impingement of the jetted stream with the object to be excavated, back to the jetting system via the abrasive particle inlet, the abrasive particle inlet having an entrance window, characterized in that filtering means are provided in a path fluidly connecting said return stream with the entrance window, for keeping the abrasive particle inlet free from objects of the same size or larger than the size of the entrance window, which filtering means is passable for the abrasive particles.

2. Tool according to claim 1, wherein the filtering means is provided with one or more filter openings shaped or arranged such that the filtering means is impassable for a particle having the same projected size and shape as the entrance window of the abrasive particle inlet and at the same time such that the one or more filter openings cannot be fully blocked by one such a particle.

3. Tool according to claim 2, wherein at least one filter opening is provided with a relatively large aspect ratio, which filter opening is in one direction sized smaller than the entrance window of the abrasive particle inlet and in another direction larger than said entrance window.